



# Resource Management & Research Report

## Indiana State Parks

No. 15-2

Memories made naturally.

**Title:** 2014 State Park Deer Reduction Results

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**Abstract:** 2014 marked the twenty first anniversary of deer reductions in Indiana State Parks. The reductions started in 1993 as an effort to mitigate damage to vegetation and unique habitat by an overpopulation of white-tailed deer (*Odocoileus virginianus*). The first reduction hunt was held at Brown County State Park in 1993. Multiple parks have hosted non-recreational deer reductions annually since 1995 and have included up to 21 parks per year. The decision to initiate reductions at individual parks has been based on scientific vegetation monitoring. Decisions to continue reductions at individual parks are made annually using harvest data and consideration to elemental occurrence and status of rare, threatened, and endangered flora that could be affected by excessive browsing by deer. In 2014, 4,606 hunter efforts were used to assist 18 parks and one state natural area. The result was a harvest of 1,004 deer. A standby drawing was offered at four parks helping reduce the impact of originally drawn hunters not showing up or not returning on the second day of each hunt. The 2014 harvest yielded a mean harvest per effort of 0.23 which is at the upper level of the program target.

### Introduction

White-tailed deer (*Odocoileus virginianus*) have thrived in Indiana State Parks since they were reintroduced to Indiana in the middle 20<sup>th</sup> century. Mild winters, absence of once present natural predators, and a decades-long lack of human hunting within protected state park boundaries resulted in excessive browsing by deer that compromised the overall composition, structure and function of most natural communities throughout the state park system. Browse lines and small, malnourished deer were a common sight at most state park properties by the late 1980's.

The first deer reduction hunt was held in 1993, with 466 hunters harvesting 392 deer. Since 1995, as many as 21 parks, 22 if including Cave River Valley State Natural Area (CRV), have held reduction hunts in the same year (Table 1). The decision to initiate reductions at any one park has been supported by data from monitoring particular herbaceous species at individual parks. Once parks begin reductions, harvest data are incorporated into annual decisions regarding habitat recovery and whether specific parks require a reduction the following year. Research indicates that vegetation and habitat begin to recover from over browsing at a property once a rate of firearm harvest per effort (H/E) lowers to 0.22-0.20 and/or a harvest per square mile (H/Mi<sup>2</sup>.) is between 12 & 16 deer. Hunters are drawn for each park to fit a density of one hunter per 15-20 acres. Parks where archery is regularly used (Clifty Falls and Fort Harrison) due to

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urban interface, have an H/E target of 0.10-0.08 and one hunter per 7-10 acres. Participants have been allowed to take up to three deer each (one of which could be antlered). These deer are in addition to regular statewide bag limits. Hunters who harvest receive “bonus” permanent tags from the park at no charge.

Eighteen state parks required deer reductions in 2014. Additionally, CRV (north of Campbellsburg), managed by Spring Mill State Park, was included. The first two-day hunt was held November 17 & 18 and the second was held December 1 & 2. A total of 1,004 deer were harvested with 4,606 hunter efforts across two, 2-day reductions. The mean 2014 H/E was 0.23, which is the lowest and closest to target harvest rates the program has had. The previous all time low was 0.25 which occurred in 2007.

Areas of snow and ice developed across the state the night before and into the first morning of the first reduction period. Some areas had six inches of snow. Temperatures were between single digits and mid-20's with high winds in most areas. The second round had warmer temperatures but rain and sleet around most areas.

Mean no-show of originally drawn participants was 45%, which is near equal to the previous five year average of 46%. This number represents drawn hunters that do not show at all or only participate one of the two days they are drawn for.

H/E data continue to indicate relative stability from 2007 to 2014 with a slight increase in 2010 and again in 2012.

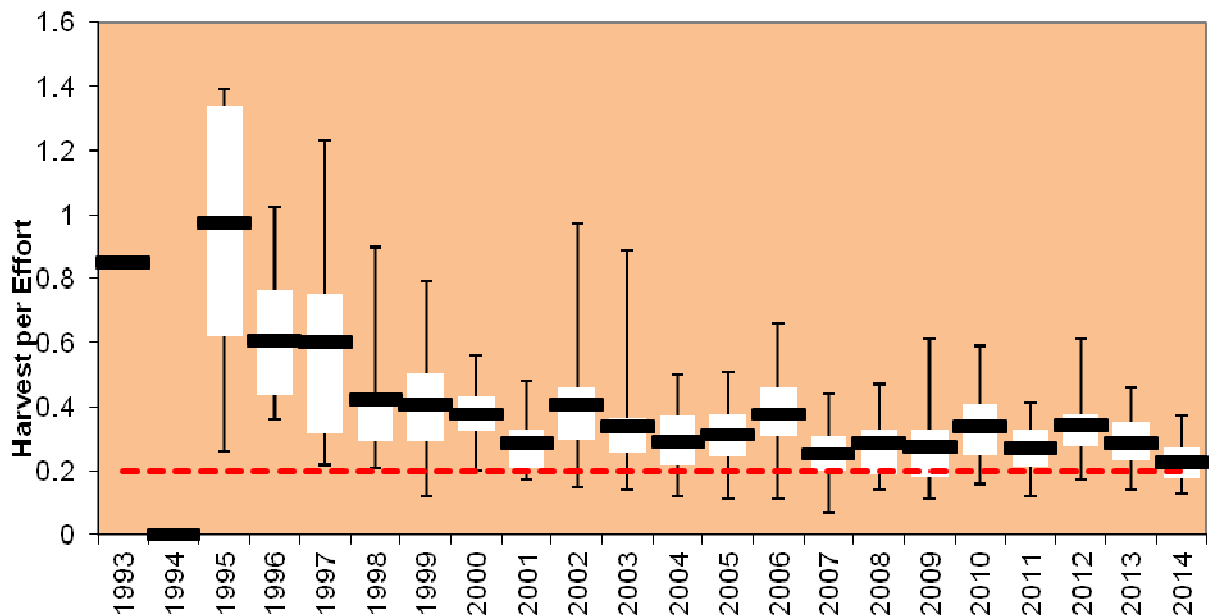
The 2014 mean H/E of 0.23 was the lowest in program history, this improves the cumulative five year average mean H/E from being 0.10 above target harvest rates to an improved 0.07 above target mean (Figure 1). Approximately half of parks participating with firearms in 2014 fell successfully at or below target H/E threshold after the 2014 reduction effort. The result will likely be that considerably fewer firearm parks will require reductions in 2015. Both archery parks however, remain far above target harvest rates. These parks will likely continue to require annual reductions for some time.

**Table 1. Number of State Parks and Deer Harvested 1993-2014**

Year	Number of	
	Parks	Total Deer
1993	1	392
1994	0	0
1995	5	1,422
1996	7	2,027
1997	9	2,430
1998	10	1,735
1999	10	1,599
2000	15	1,697
2001	13	1,483
2002	14	1,609
2003	20	2,121
2004	15	1,253
2005	16	1,336
2006	17	2,213
2007	18	1,300
2008	17	1,468
2009	17	1,334
2010	16	1,689
2011	22	1,546
2012	14	1,292
2013	22	1,763
2014	19	1,004
Total Deer:		32,713

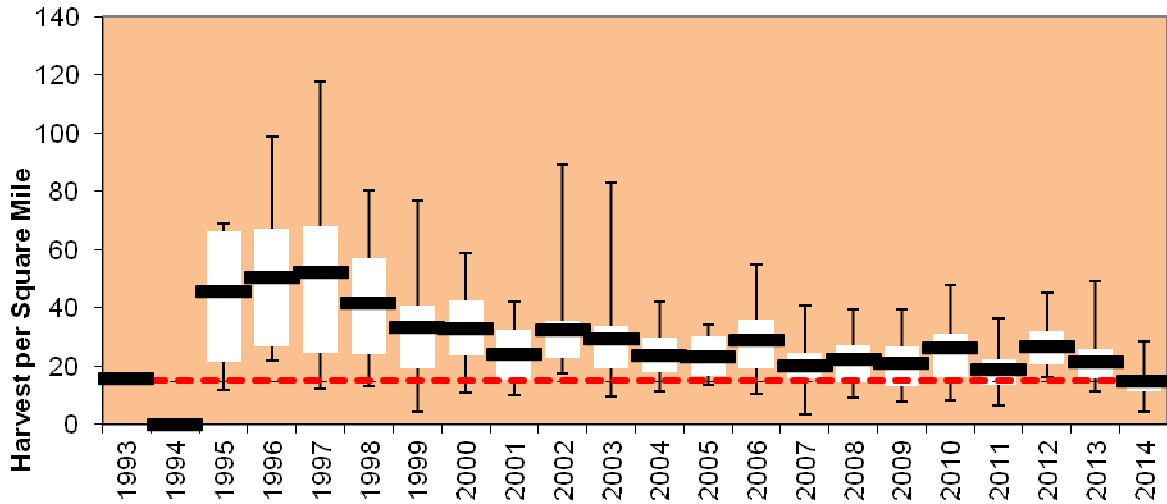
A similar trend is demonstrated with  $H/Mi^2$ . The cumulative five year average mean  $H/Mi^2$  is currently six deer/ $Mi^2$  above target levels (Figure 2). This is an improvement from the previous five year average of eight above mean target. 65% of firearm properties participating in 2014 successfully fell at or below target  $H/Mi^2$ .

Percentage of adult bucks harvested has increased steadily since the reduction program began. The current cumulative five year mean adult buck harvest is 33%. Though fewer adult bucks were harvested the last couple years, 42% of properties participating in 2014 harvested more than 40% adult bucks (Figure 3). One park harvested 56% adult bucks. The annual average percentage of parks that exceeded 40% from 2001 to 2005 was 33%. There are a few parks that consistently harvest beyond 40% adult bucks. Such parks may need to switch into an incentive model for hunters, helping ensure over selective hunting is not occurring. Examples include “earn a buck” and antler removal by park staff at check stations. One must first harvest an antlerless deer before harvesting an antlered deer within the “earn a buck” model.



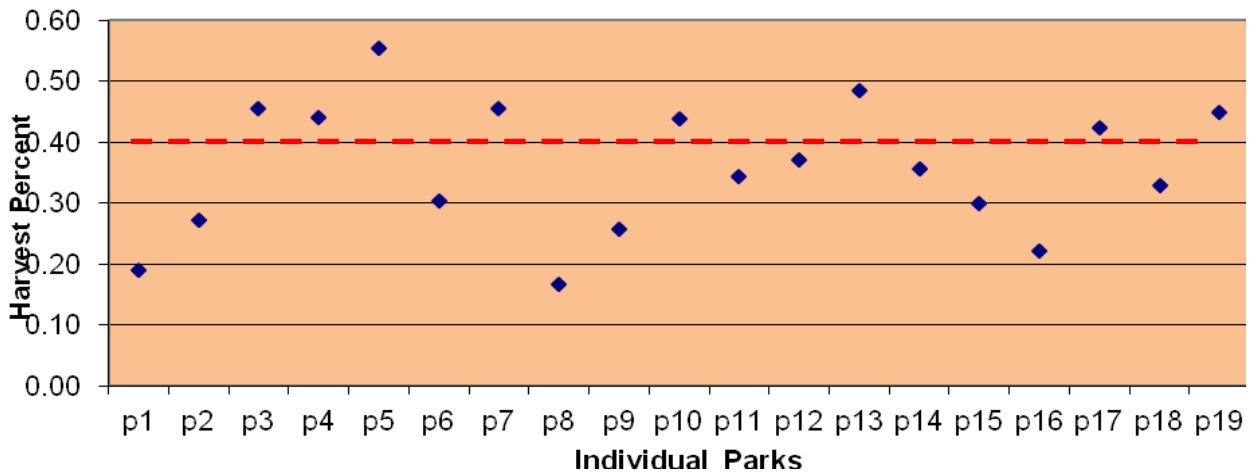
**Figure 1. 1993-2014 Harvest Per Effort.** The center black bar indicates the mean H/E for each year. The white box indicates the first quartile and third quartile. The whiskers represent the minimum and maximum H/E for each year. The white (hashed) line highlights the 0.20 target H/E level for firearms. Only one property (Brown County) was hunted in 1993, and no properties were hunted in 1994.

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**Figure 2. 1993-2014 Harvest Per Square Mile.** The center black bar indicates the mean harvest per square mile for each year. The white box indicates the first quartile and third quartile. The whiskers represent the minimum and maximum harvest per square mile for each year. The white (hashed) line highlights the target of 15 harvest per square mile level for firearms. Only one property (Brown County) was hunted in 1993, and no properties were hunted in 1994.

## 2014 Adult Bucks



**Figure 3. 2014 Percent Adult Bucks Harvested.** Each label (p1 – p19) represents one of the 19 properties hunted in 2014 including Cave River Valley Natural Area administered by Spring Mill State Park.

### Standby Drawing

A standby drawing was held again at three state parks in an attempt to fill spots left vacant by originally drawn hunters. The objective was to increase hunting pressure on deer. Similar to years past, this drawing was carried out with moderate success. Participating properties were selected based on elevated no-show rates upwards of 50% or higher in recent years. These parks are also laid out in such a way that facilitates an ample staging area for the drawing while providing staff ability to monitor and control potential standby hunters' entry into the park.

Participants in the standby drawing were chosen daily onsite and had to meet the same eligibility as those originally drawn (Indiana residents or in possession of a lifetime license for harvesting deer, 18 years of age by the date of the first hunt, and possession of a valid license to hunt deer in Indiana). Given expected success rates on the first day of each hunt and other factors, parks can generally target no-show rates between 25-30%. The average no-show rate for 2014 was 45%. This is right in line with the current five year average no-show rate of 46%.

Though H/E by standby hunters has varied widely between 0.04 and 0.31 in recent years, the average number of no-shows across all participating parks can be expected to drop by approximately 10% using the standby drawing. 23% of all deer harvested at one property in 2013 were taken with standby hunters.



### Summary

Though cumulative harvest rates seem to have stalled slightly higher than desirable, statistics continue to illustrate overall success for the deer reduction program. The program has performed well at coming closer to target harvest levels the last couple years. Though some parks are more successful than others at achieving a maintenance phase of taking a year off every couple years, the data have and continue to indicate habitat recovery as well as sustained deer populations. It should be reiterated that park reductions are not intended to manage populations for optimal recreational hunting. The goal is to simply reduce the impact of browsing to a level that allows some of Indiana's rarest and most unique natural communities to thrive.

As stated in previous reports, gone are the abrupt browse lines and emaciated deer of the past but less obvious damage persists throughout the parks. In addition to competing with other fauna for limited resources within park boundaries, deer continue to impact rare, threatened, and endangered flora as well as valuable habitat such as oak forests. Other impacts include

**Table 2. 2014 Parks Requiring Reduction and Resulting Harvest**

Park	Harvest
Brown County	111
Cave River Valley	9
Chain O'Lakes	66
Charlestown	77
Clifty Falls	24
Fort Harrison	35
Harmonie	89
Indiana Dunes	35
Lincoln	43
McCormick's Creek	33
Ouabache	42
Pokagon	40
Potato Creek	136
Prophetstown	26
Shakamak	42
Spring Mill	22
Summit Lake	22
Tippecanoe	123
Whitewater	29
<b>Total</b>	<b>1,004</b>

compromised understory structure for ground and shrub nesting song birds. The 2014 effort was once again a success in helping reduce and maintain browse effects. Cumulative 2014 harvest numbers are consistent with recent positive trends (Table 2).

Although there has been some concern voiced about the potential of overharvesting (primarily by adjacent landowners), it is clear that deer are still thriving in the parks. Harvest rates at parks consistently remain very well above rates at areas where open, public hunting is allowed. Deer hunting continues to be a viable recreational pursuit year in and year out in such areas. A random sampling of harvest data from state reservoir properties on the first and second weekend of regular deer firearms season revealed an average H/E of 0.05. Park properties take a year off once a H/E gets down to 0.20-0.22.

It should be noted that harvest numbers alone have limited value in determining the success of a reduction hunt. Many factors such as park acreage, weather, rate of participation, and other local factors can influence a park's given harvest from year to year. This is an additional reason that H/E is used more as an indicator of success than simple harvest numbers alone.

Parks requiring reductions in 2015 will be listed and made available along with online applications for 2015 hunts in July 2015 at <http://www.in.gov/dnr/fishwild/5834.htm> along with other IDNR reserved hunts.